FLORENCE COPPER

**FLORENCE COPPER INC.**
1575 W. Hunt Highway, Florence, Arizona 85132 USA
florencecopper.com

July 21, 2021

Ms. Nancy Rumrill
U.S. Environmental Protection Agency, Region 9
Drinking Water Protection Services, WTR-4-2
75 Hawthorne Street
San Francisco, California 94105

**Re: Revised Proposed Annular Conductivity Device Demonstration Submitted in Support of Application for Underground Injection Control Permit, Florence Copper Project, Florence, Arizona**

Dear Ms. Rumrill:

Florence Copper Inc. (Florence Copper) herewith transmits a description of a revised proposed annular conductivity device (ACD) demonstration to be conducted during commercial In-Situ Copper Recovery (ISCR) operations. This proposal is submitted in support of our application for an Underground Injection Control (UIC) Permit submitted to the U.S. Environmental Protection Agency (USEPA) on October 4, 2019 (Application). This proposal reflects our understanding of the requests stated by the USEPA in our July 20, 2021 phone call and supersedes previous ACD demonstration proposals submitted to USEPA in December 2020.

## Proposed ACD Demonstration

The USEPA has indicated that a demonstration of the effectiveness of the ACDs would be required during commercial ISCR operations. The USEPA indicated that the demonstration should include physical contact of injected fluid with one or more installed ACDs to show the type of response that may be expected from vertical migration of injected fluid, if such were to occur during ISCR operations.

In response to this request, Florence Copper proposes the following ACD demonstration and contingency actions in addition to those described above. The demonstration proposed herein will include installation of two sacrificial ACDs within the authorized injection zone on two injection wells (one on each well). The proposed demonstration will begin with the commencement of ISCR operations and will conclude with positive indication that injected fluid has reached the sacrificial ACDs.

### ACD Demonstration

1. During construction of the first resource block to be activated, Florence Copper will install one ACD each, on two injection wells, at a depth below the 40-foot exclusion zone. Florence Copper will extend the cement seal on the selected injection wells to a depth of 50 feet below the top of

bedrock (ten feet below the exclusion zone). The ACDs will be installed below the exclusion zone within the 10-foot well extension. At the commencement of ISCR operations, injected fluid is anticipated to advance to the location of the sacrificial ACDs within the authorized injection zone.

2. Monthly, Florence Copper will collect resistivity data from each of the sacrificial ACDs installed on the injection wells selected for ACD demonstration.
3. Six months after injection begins at the first resource block to be activated, Florence Copper will conduct a statistical comparison of the average readings from the sacrificial ACDs to the early warning ACDs within the same resource block. The statistical analyses will include:
    a. Outlier test of each ACD dataset.
    b. Analysis of the group population distribution to determine if an assumption of normal distribution can be applied.
    c. Evaluation of trends occurring in the dataset for each ACD and each ACD group (e.g., upper basin fill unit (UBFU), LBFU, up gradient and down gradient).
    d. Comparison of group means to determine if the sacrificial ACDs and early warning ACDs are derived from similar data populations.
    e. Comparison of the group trends defined above to the sacrificial ACD data population average readings and trends observed during injection.

    The comparison will identify statistically significant decreases in resistivity in the sacrificial ACD dataset relative to the early warning ACD values in the same resource block. Statistical analyses will be conducted in accordance with USEPA Unified Guidance titled *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities*, dated 2009.
4. Six months after injection begins at the first resource block to be activated, perform statistical analysis of the sacrificial ACD readings to identify statistically significant changes from baseline values.

The ACD demonstration will be judged successful when statistical analyses of the resistivity values measured at the sacrificial ACDs depart from baseline values.

Prior to conducting the ACD demonstration, Florence Copper will install two monitoring wells in the first resource block to be developed and brought online. The wells (M72-UBF and M73-LBF) will be sited based on the location of known faults and/or areas of known higher fracture intensity. Well M72-UBF will be completed in the UBFU, with a 10-foot well screen installed within 20 feet of the top of the MFGU. Well M73-LBF will be completed in the LBFU, with a 10-foot well screen installed within 20 feet of the bottom of the MFGU. The approximate locations of monitoring wells M72-UBF and M73LBF were previously provided to USEPA on Figure A-19.

**Early Warning ACD Analysis Contingency Actions**

If the demonstration does not show a statistically significant change from baseline values, Florence Copper will implement the following contingency actions:

1. Review the ACD data trends for each of the early warning ACDs installed within the resource block to identify the area where the greatest decrease in resistivity has occurred as described above in step 2 of the Early Warning ACD Analysis section.
2. Incorporate the newly installed monitoring wells (M72-UBF and M73-LBF) into the established monitoring program for the fault for the USDW and fault monitoring wells.

Florence Copper believes this proposal to be responsive to the USEPA request for an ACD demonstration and associated contingency actions. Florence Copper hereby requests that the USEPA incorporate these elements into the UIC Application.

Please contact me at 520-316-3710 if you require any additional information.

Sincerely,
Florence Copper Inc.

Brent Berg
General Manager

cc: Maribeth Greenslade, Arizona Department of Environmental Quality